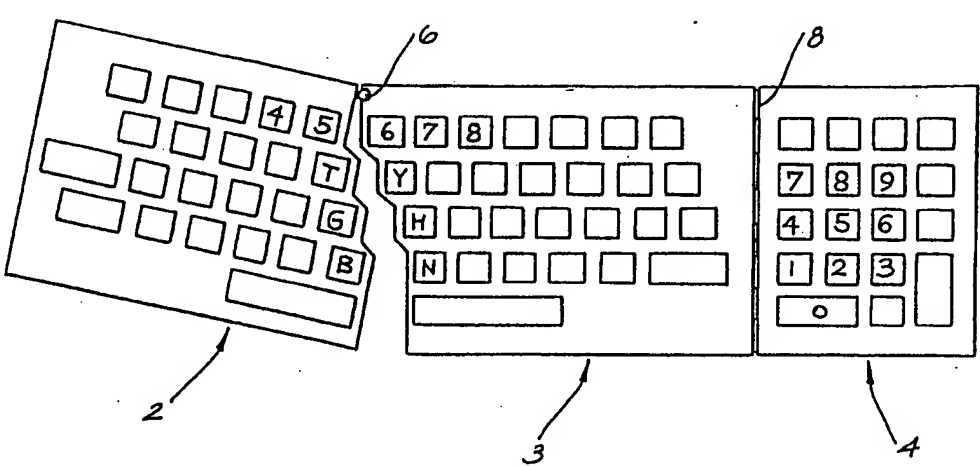




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>5</sup> :</b>  <b>B41J 5/10, H01H 13/70</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 92/00851</b>  <b>(43) International Publication Date:</b> <b>23 January 1992 (23.01.92)</b>
<b>(21) International Application Number:</b> PCT/AU91/00301 <b>(22) International Filing Date:</b> 8 July 1991 (08.07.91) <b>(30) Priority data:</b> PK 1123                      10 July 1990 (10.07.90)                      AU <b>(71)(72) Applicant and Inventor:</b> GOLDSTEIN, Mark [AU/ AU]; 4/4 Greenoaks Avenue, Darling Point, NSW 2027 (AU). <b>(74) Agent:</b> SPRUSON & FERGUSON; G.P.O. Box 3898, Syd- ney, NSW 2001 (AU). <b>(81) Designated States:</b> AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI pa- tent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CI (OAPI patent), CM (OA- PI patent), DE, DE (European patent), DK, DK (Euro- pean patent), ES, ES (European patent), FI, FR (Euro- pean patent), GA (OAPI patent), GB, GB (European pa- tent), GN (OAPI patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MN, MR (OAPI patent), MW, NL, NL (European patent), NO, PL, RO, +SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.		<b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> KEYBOARD    <b>(57) Abstract</b>  <p>The invention relates to a keyboard (1) to be used for example at a computer terminal. The preferred embodiment comprises a keyboard (1) having mounted thereon a number of keys (5), the keyboard being formed in at least two segments (2, 3) which are mutually detachable and/or pivotable and wherein each of the segments (2, 3) of the keyboard (1) has mounted thereon some of the keys (5). The pivoting/detachable nature of the keyboard aims at reducing stress and discomfort to the user by eliminating contortion to the operators wrists. More particularly, discomfort to the user caused by pronation of the wrists and/or supination of the wrists is reduced.</p>		

# + DESIGNATIONS OF "SU"

It is under examination in which parts of the former Soviet Union the designation of the Soviet Union has effect.

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KEYBOARDFIELD OF THE INVENTION

The following invention relates to keyboards, and more particularly though not exclusively to a keyboard formed in two or more mutually pivotable segments.

PRIOR ART

Known keyboards of the type used at a computer terminal for example, comprise a unitary board onto which a plurality of alpha numeric keys are attached. It is a disadvantage of such known keyboards that the wrists and/or arms and shoulders of an operator must be contorted into a configuration which is stressful to the user after prolonged use of the keyboard. This problem is brought about by the fact that the hands of the user must be turned outwardly by pivoting of the wrists relative to the forearms.

Discomfort to the user caused by pronation of the wrists is also a problem. It is desirable to reduce pronation and aim for supination of the wrists.

OBJECT OF THE INVENTION

It is the object of the present invention to overcome or substantially ameliorate the above disadvantages.

DISCLOSURE OF THE INVENTION

There is disclosed herein a keyboard having mounted thereon a plurality of keys, the keyboard comprising at least two segments which are mutually detachable and/or pivotable and wherein each segment of the keyboard has mounted thereon some of said keys.

Typically, the keyboard comprises two mutually pivotable segments which are attached to one another at a top end of the keyboard by way of a hinge means such that a bottom end of the keyboard may spread apart in a substantially horizontal plane.

Advantageously, the hinge means is adapted to allow pivoting in both horizontal and vertical planes such that said two segments of the keyboard may reside in different planes, such that the center of the keyboard is raised so as to reduce pronation and therefore decrease tension in the wrists and forearms of a user.

Generally, said hinge means is a ball and socket joint.

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Advantageously, a support means is provided generally below the ball and socket joint so as to maintain the central region of the keyboard at a raised preselected level.

Beneficially, a number pad region of the keyboard is pivotable relative to one of said segments such that the number pad region may reside in a plane other than the plane of said segment to which said number pad is hinged.

Typically, the keyboard is divided into segments which coincide with generally accepted keyboard areas.

The present invention provides means by which wrists of an operator need not be contorted as they would be in use of a conventional keyboard.

In order to electrically connect the keys of one segment of the keyboard to the other, a cable or any suitable contact means may be provided between the two segments.

#### BRIEF DESCRIPTION OF THE DRAWINGS

A preferred form of the present invention will now be described by way of example with reference to the accompanying drawings, wherein:

Fig. 1 is a schematic plan view of a keyboard, and

Fig. 2 is a schematic elevational view of the keyboard of Fig. 1.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In the accompanying drawings there is schematically depicted a keyboard generally indicated by reference numeral 1. Keyboard 1 comprises separate segments 2, 3 and 4 each having mounted thereto a plurality of keys 5.

Segments 2 and 3 of keyboard 1 are mutually attached by means of hinge 6 which may provide one or more degrees of freedom of relative movement between segments 2 and 3. Hinge 6 in the preferred embodiment is of ball and socket type construction.

Segment 4 of keyboard 1 which has mounted thereon numerical keys 5 is attached to segment 3 of hinge 7. Hinge 7 may extend along line 8 illustrated in Fig. 1 so as to provide 1 degree of relative movement between segments 3 and 4. Alternatively, a ball and socket type joint as employed between segments 2 and 3 may be located at either an upper or lower end of line 8 in Fig. 1.

It should be appreciated that segments 2 and 3 of keyboard 1 may pivot with respect to one another while each remaining in a single plane.

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As depicted in Fig. 2 however a center region of keyboard 1 is raised above the level of a desk on which the keyboard is supported.

Segments 2, 3 and 4 of keyboard 1 may be completely detached from one another to provide an additional degree of freedom of relative positioning therebetween.

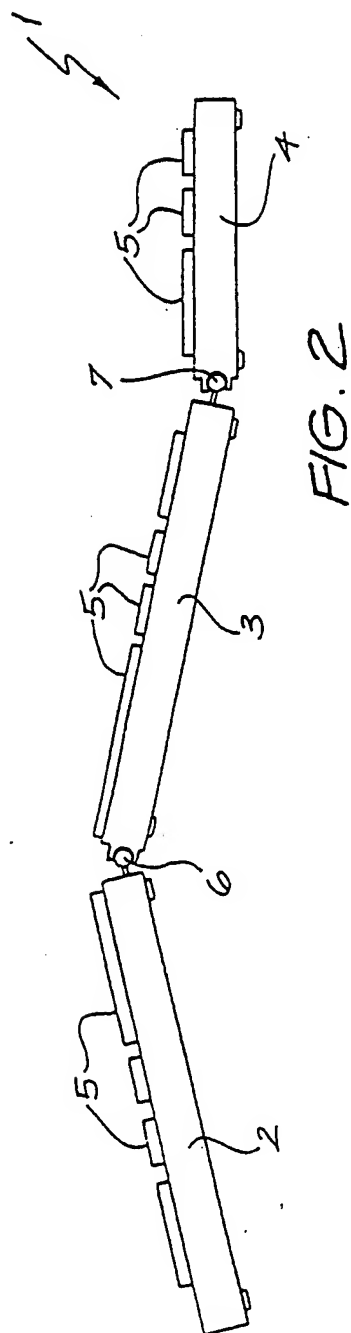
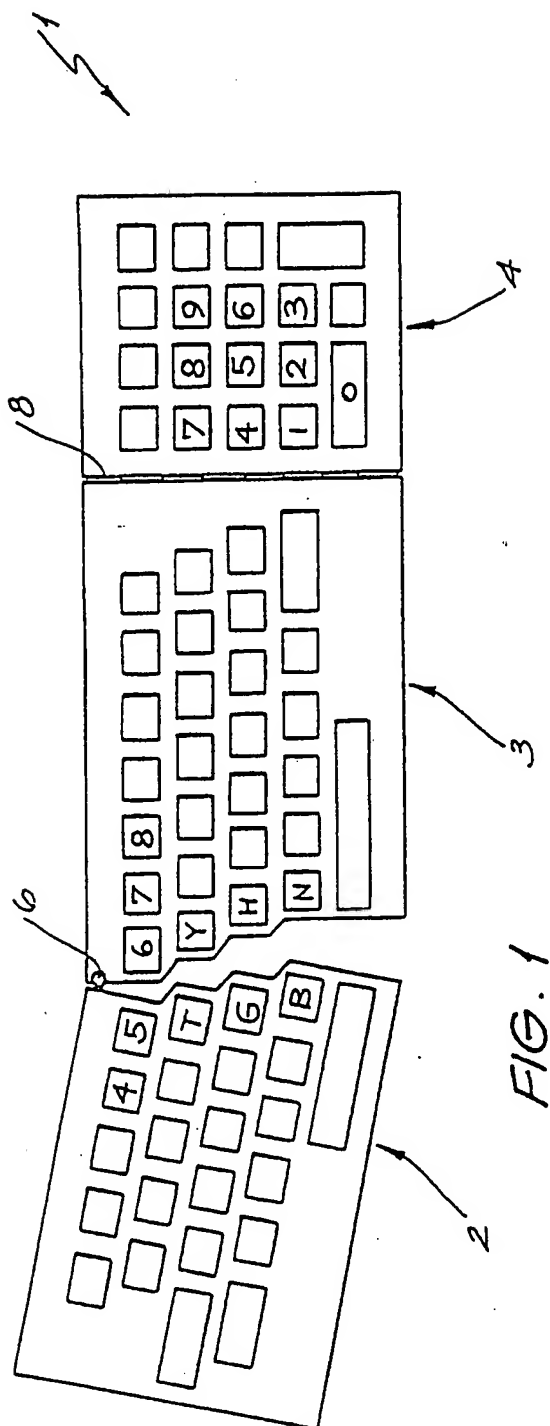
Should an operator of the keyboard not be comfortable with a hinged apart orientation of the keyboard, it may simply be returned to a conventional configuration.

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## Claims:


1. A keyboard having mounted thereon a plurality of keys, the keyboard comprising at least two segments which are mutually detachable and/or pivotable and wherein each segment of the keyboard has mounted thereon some of said keys.
2. The keyboard of claim 1 comprising two mutually pivotable segments which are attached to one another at the top edge of the keyboard by way of hinge means such that a bottom edge of the keyboard may spread apart in a substantially horizontal plane.
3. The keyboard of claim 2 wherein the hinge means is adapted to allow pivoting in both horizontal and vertical planes.
4. The keyboard of claim 2 wherein said hinge means is a ball and socket joint.
5. The keyboard of claim 2 wherein a support means is provided generally below the hinge means so as to maintain a central region of the keyboard at a raised preselected level.
6. The keyboard of claim 1 wherein a number pad region of the keyboard is pivotable relative to one of said segments such that the number pad region may reside in a plane other than the plane of said segment to which said number pad region is hinged.
7. The keyboard of claim 1 being divided into segments which coincide with generally accepted keyboard areas.

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# INTERNATIONAL SEARCH REPORT

International Application No. PCT/AU 91/00301

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) 6				
According to International Patent Classification (IPC) or to both National Classification and IPC				
Int. Cl. <sup>5</sup> B41J 5/10, H01H 13/70				
<b>II. FIELDS SEARCHED</b>				
Minimum Documentation Searched 7				
Classification System	Classification Symbols			
IPC	B41J 5/08, 5/10, H01H 13/70			
Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched 8				
AU : IPC as above				
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> 9				
Category*	Citation of Document, with indication, where appropriate, of the relevant passages 12	Relevant to Claim No 13		
X,Y	AU,A, 59038/86 (HODGES) 1 December 1987 (01.12.87) See Figures 1 to 4.	(1,2,3,5,7)		
X,Y	US,A, 3990565 (FELTON et al) 9 November 1976 (09.11.76) See Figures 1,7.	(1,2,3,4,7)		
X,Y	US,A, 4509873 (RYAN) 9 April 1985 (09.04.85) See Figures 1,2,5,7.	(1,2,3,5,6,7)		
X,Y	WO,A, 85/03035 (LAHR) 18 July 1985 (18.07.85) See Figures 1,2,3,4,7c.	(1,2,3,6,7)		
X,Y	US,A, 3940758 (MARGOLIN) 24 February 1976 (24.02.76) See Figures 2,6,7.	(1,3,6,7)		
X	WO,A, 84/00518 (RYAN) 16 February 1984 (16.02.84) See Figures 2,3.	(1,5,7)		
X	US,A, 4378553 (McCALL) 29 March 1983 (29.03.83)	(1,5,7)		
<p>* Special categories of cited documents: 10</p> <table style="width: 100%;"> <tr> <td style="width: 50%;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 50%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Z" document member of the same patent family</p> </td> </tr> </table>			<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Z" document member of the same patent family</p>
<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Z" document member of the same patent family</p>			
<b>IV. CERTIFICATION</b>				
Date of the Actual Completion of the International Search 11 September 1991 (11.09.91)	Date of Mailing of this International Search Report 17 September 91			
International Searching Authority  Australian Patent Office	Signature of Authorized Officer   P.F. GOTHAM			



ANNEX TO THE INTERNATIONAL SEARCH REPORT ON  
INTERNATIONAL APPLICATION NO. PCT/AU 91/00301

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Members	
AU 59038/86		WO 8706883	
WO 8400518		AU 18260/83	
WO 8503035	EP 168484	US 4661005	

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